

# EXHIBIT 4

Messages in mpdm-rose--cameron--tyler-1 on 2017-09-03

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 02:49 PM  
Rose is there self-trade prevention between books?

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 02:58 PM  
And can u tell me what fee overrides are in effect for account 12488

**RT** **rose (Rose Toomey)** 2017-09-03 03:16 PM  
I posted all the current fee overrides in the market makers channel Friday

**RT** **rose (Rose Toomey)** 2017-09-03 03:16 PM  
There is self trade prevention in that a single account may not self trade

**RT** **rose (Rose Toomey)** 2017-09-03 03:17 PM  
But I am unclear how good our ownership analysis is

**RT** **rose (Rose Toomey)** 2017-09-03 03:17 PM  
I.e. trying to prevent a single entity from setting up multiple accounts to collude

**RT** **rose (Rose Toomey)** 2017-09-03 03:18 PM  
Sorry I'm out at the playground now but I will be online to address this in more detail after 7 pm

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 03:18 PM  
Ok great.

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 03:22 PM  
I see no override on 12488. Can you tell me history of overrides if any for that account?

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 03:22 PM  
<https://admin.service.production.internal.projecticeland.net/accounts/12488>

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 03:23 PM  
I see pretty high balances, but no transfers of significant value into the account.

**RT** **rose (Rose Toomey)** 2017-09-03 03:50 PM  
Sure, will do first thing after 7pm

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:40 PM  
Can you tell me current Auction fee schedule?

**RT** **rose (Rose Toomey)** 2017-09-03 06:41 PM  
hey, just got the little ones to bed

**RT** **rose (Rose Toomey)** 2017-09-03 06:41 PM  
yes, the auction fee schedule uses the maker schedule, it doesn't have its own schedule

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:41 PM  
has it always been that way?

**RT** **rose (Rose Toomey)** 2017-09-03 06:41 PM  
we had discussed creating its own schedule because it's a frequent source of net losses where two makers with rebates cross

**RT** **rose (Rose Toomey)** 2017-09-03 06:41 PM  
yes

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:42 PM  
are we down?

**RT** **rose (Rose Toomey)** 2017-09-03 06:43 PM  
the exchange is up, is something making you think it's down?

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:44 PM  
must be my computer.

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:44 PM  
so if I place a 100 limit on auction and tyler places a 100 limit on auction, we could both hit each other and get rebates?

**RT** **rose (Rose Toomey)** 2017-09-03 06:44 PM  
yes, this happens semi-frequently

**RT** **rose (Rose Toomey)** 2017-09-03 06:44 PM  
less over time

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:44 PM  
explain the scenario on the continuous book where we could lose money

**RT** **rose (Rose Toomey)** 2017-09-03 06:45 PM  
well, it happens on the continuous book as well as in auction!

**DX 313**

**RT** **rose (Rose Toomey)** 2017-09-03 06:45 PM  
 auction is the worst case - imagine both sides receive a 15 bps rebate

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:46 PM  
 Ok

**RT** **rose (Rose Toomey)** 2017-09-03 06:46 PM  
 however, on the continuous book it used to be reasonably common when we were getting ETHUSD underway for market makers with generous fee concessions to cross each other all day long

**RT** **rose (Rose Toomey)** 2017-09-03 06:46 PM  
 you have satoshi to thank for stopping that, he came aboard and somehow paid way more in fees :slightly\_smiling\_face:

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:46 PM  
 LOL.

**RT** **rose (Rose Toomey)** 2017-09-03 06:47 PM  
 that or his bad algo somehow stepped in the middle of everything and couldn't get out

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:47 PM  
 so explain how we lose money on the ETC/BTC book?

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:47 PM  
 A person makes for 15 rebate / the taker crosses at < 15 fee?

**RT** **rose (Rose Toomey)** 2017-09-03 06:47 PM  
 that's an interesting question. probably because it's our smallest market, so i imagine shane has been actively trying to encourage activity

**RT** **rose (Rose Toomey)** 2017-09-03 06:48 PM  
 it's primarily composed of day traders and larger market makers looking to shift BTC ETH for their own convenience

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:48 PM  
 taken to the extreme, if 2 market makers were crossing each other we would lose money

**RT** **rose (Rose Toomey)** 2017-09-03 06:48 PM  
 we can and do

**RT** **rose (Rose Toomey)** 2017-09-03 06:48 PM  
 there's a metric in grafana that tracks it, noah set it up

**RT** **rose (Rose Toomey)** 2017-09-03 06:49 PM  
 is there a particular time period you would like me to investigate ETHBTC losing money?

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:49 PM  
 Overall Gemini is out 10 bps. MM 1 gains 15bps, MM 2 pays 5bps

**RT** **rose (Rose Toomey)** 2017-09-03 06:50 PM  
 i was not privy to whatever metrics were used to decide on fee rebates. clearly, from what i posted in market makers channel, sometimes fee rebates were assigned to market makers who failed to deliver and took a free ride

**RT** **rose (Rose Toomey)** 2017-09-03 06:50 PM  
 however i don't know what criteria was used, what discussions were had, what arrangements were in place

**RT** **rose (Rose Toomey)** 2017-09-03 06:51 PM  
 so i may see just one side of things! perhaps the fee rebates offset greater income from block trades that i don't know about

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:53 PM  
 Can you tell me who hits who on a book?

**RT** **rose (Rose Toomey)** 2017-09-03 06:53 PM  
 i can tell you which account id

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:53 PM  
 like who hit who on the ETH/BTC book.

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:54 PM  
 And the ETH/USD book.

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:54 PM  
 from May - August.

**RT** **rose (Rose Toomey)** 2017-09-03 06:54 PM  
 i do have admin site access that i can use to resolve the account id to the account name

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:54 PM  
 I know the names

- CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:54 PM  
just need account IDs
- RT** **rose (Rose Toomey)** 2017-09-03 06:54 PM  
which is fortunate because i'm the only pgross approver around and i can't approve myself - weekends are always tough that way
- RT** **rose (Rose Toomey)** 2017-09-03 06:55 PM  
ok, i will get you those trades with the account ids
- RT** **rose (Rose Toomey)** 2017-09-03 06:55 PM  
i was just about to get you the fee overrides for account 12488
- RT** **rose (Rose Toomey)** 2017-09-03 06:56 PM  
i can also tell you, right now, who the top N market makers in each market are - i showed john how to do that friday
- CW** **cameron (Cameron Winklevoss)** 2017-09-03 06:57 PM  
Yes all of that info would be helpufl
- RT** **rose (Rose Toomey)** 2017-09-03 07:09 PM  
account 12488 has never had any fee overrides. here is his fee schedule  
  
account\_fee\_schedules\_12488.csv  
  
[https://iceland.slack.com/files/U02GKPU6P/F6XQLSSUV/account\\_fee\\_schedules\\_12488.csv](https://iceland.slack.com/files/U02GKPU6P/F6XQLSSUV/account_fee_schedules_12488.csv)
- RT** **rose (Rose Toomey)** 2017-09-03 07:11 PM  
he's the #3 market maker in ETHUSD and ETHBTC  
  
most recent market rankings  
  
[https://iceland.slack.com/files/U02GKPU6P/F6X1FT1A4/most\\_recent\\_market\\_rankings.csv](https://iceland.slack.com/files/U02GKPU6P/F6X1FT1A4/most_recent_market_rankings.csv)
- RT** **rose (Rose Toomey)** 2017-09-03 07:13 PM  
and he helps to achieve his discounts via a combination of volume and, as you can see, very even maker-taker ratio
- CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:13 PM  
Is that notional USD volume?
- CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:13 PM  
\$631,954.6439
- CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:14 PM  
\$1,016,264.514
- RT** **rose (Rose Toomey)** 2017-09-03 07:14 PM  
`total_volume_base` is in the base of whatever the trading pair is
- CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:14 PM  
so basically \$500MM on ETH/BTC and \$1BB on ETH/USD
- RT** **rose (Rose Toomey)** 2017-09-03 07:14 PM  
so no, that's ETH
- CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:14 PM  
can you give me notional dollar values
- RT** **rose (Rose Toomey)** 2017-09-03 07:15 PM  
sure
- CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:15 PM  
and do same analysis over time period for following account IDs
- RT** **rose (Rose Toomey)** 2017-09-03 07:16 PM  
btw, this is just for the last 30 days
- RT** **rose (Rose Toomey)** 2017-09-03 07:16 PM  
i'm creating a query to give you all the fills on ETHUSD and ETHBTC trade by trade
- RT** **rose (Rose Toomey)** 2017-09-03 07:16 PM  
for may, june, july, and august
- CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:16 PM  
last 30 is fine
- CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:16 PM  
for now.

**RT** **rose (Rose Toomey)** 2017-09-03 07:16 PM  
but maybe what you want is just the total dollar amounts over that time?

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:17 PM  
30 day total notional USD volume on each book is fine so i can understand in USD terms.

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:17 PM  
account ID 28199

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:18 PM  
account ID 49533

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:24 PM  
account ID 55030

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:24 PM  
account ID 57534

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:24 PM  
account ID 60094

**RT** **rose (Rose Toomey)** 2017-09-03 07:29 PM  
i can already tell you that hashicorp is number one across all three because they're getting a very favorable fee override of -12/2

notional volumes, market ranks

[https://iceland.slack.com/files/U02GKPU6P/F6XJESPSP/notional\\_volumes\\_\\_market\\_ranks.csv](https://iceland.slack.com/files/U02GKPU6P/F6XJESPSP/notional_volumes__market_ranks.csv)

**RT** **rose (Rose Toomey)** 2017-09-03 07:30 PM  
hashicorp is 49533, i remembered that because i ran some market rankings to show john, saw the same account id was #1 in all three markets, and then raced to the fee override table to find out why

**RT** **rose (Rose Toomey)** 2017-09-03 07:30 PM  
their fee override goes through 2018-01-01

**RT** **rose (Rose Toomey)** 2017-09-03 07:32 PM  
cameron (Cameron Winklevoss) for the ETHUSD, ETHBTC markets - do you want line items to roll up yourself, or do you want aggregate groupings of how often account X crosses account Y, or do you just want overall numbers by account, how much volume and fees?

**RT** **rose (Rose Toomey)** 2017-09-03 07:33 PM  
i can very quickly get you trailing 30d volume vs trailing 30d fees

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:36 PM  
aggregate is fine

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:36 PM  
and 30 day is fine

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:36 PM  
higher priority is reviewing this doc

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:36 PM  
[https://docs.google.com/document/d/12ltmcuw4MmV1lwgaLcOQ-MS\\_srj0Dtz3QjZljjZ84Rc/edit#](https://docs.google.com/document/d/12ltmcuw4MmV1lwgaLcOQ-MS_srj0Dtz3QjZljjZ84Rc/edit#)

**RT** **rose (Rose Toomey)** 2017-09-03 07:36 PM  
a dump of the actual fills would probably be a couple hundred MB, more if i include original order details and the fee schedule in effect for both sides at each point in time - i'm happy to do it for you if that's what you want but i'm betting you probably want this data processed into some conclusion like:

- grouped by account 1, account 2
- over the period of 1 may 00:00:00 EDT - 31 august 23:59:59 EDT
- total notional USD volume traded between these two accounts (where notional USD volume = price \* quantity)
- total fees for account 1, total fees for account 2

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:36 PM  
if you don't mind where I tagged you

**RT** **rose (Rose Toomey)** 2017-09-03 07:36 PM  
ok, i will go do that right now

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:36 PM  
thank you!

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 07:38 PM  
this is actually all I need for the above exercise:



**CW** cameron (Cameron Winklevoss) 2017-09-03 07:38 PM

- 1) top 3 makers on ETH/USD
- 2) top 3 takers on ETH/USD
- 3) top 3 makers on ETH/BTC
- 4) top 3 takers on ETH/BTC

**CW** cameron (Cameron Winklevoss) 2017-09-03 07:38 PM

just need account IDs and notional volume

**RT** rose (Rose Toomey) 2017-09-03 07:41 PM

great, on it. will review the docs and then come back with the numbers

U02GLRLFN reacted with: +1::skin-tone-2

**CW** cameron (Cameron Winklevoss) 2017-09-03 07:53 PM

rose (Rose Toomey) please track changes

**RT** rose (Rose Toomey) 2017-09-03 07:55 PM

i switched to suggesting mode, does this track changes? also, should i mark my items as done once i reply, if i have no further changes to make?

**CW** cameron (Cameron Winklevoss) 2017-09-03 07:55 PM

yes

**CW** cameron (Cameron Winklevoss) 2017-09-03 07:55 PM

and yes.

**CW** cameron (Cameron Winklevoss) 2017-09-03 07:55 PM

"Suggested mode" is correct.

**CW** cameron (Cameron Winklevoss) 2017-09-03 07:55 PM

or you can just comment and we will close the comments, lets do it that way so we know where to look

**CW** cameron (Cameron Winklevoss) 2017-09-03 08:00 PM

we have self trade prevention in both auctions and continous trading?

**CW** cameron (Cameron Winklevoss) 2017-09-03 08:00 PM

(iv) Self-trade prevention that prohibits the same market participant from crossing with himself or herself on a continuous trading Order Book or in a Gemini Auction.

U02GKPU6P reacted with: white\_check\_mark

**RT** rose (Rose Toomey) 2017-09-03 08:02 PM

yes, we have both: if a participant submits an order that could cross a standing order on the continuous book or the auction book, then the incoming order will be cancelled

**CW** cameron (Cameron Winklevoss) 2017-09-03 08:02 PM

so is the statement above accurate?

**RT** rose (Rose Toomey) 2017-09-03 08:03 PM

where we do not attempt "self trade" prevention is where the auction book and the continuous book are folded together during the auction: because the auction fill is regarded as a bulk trade, it would be possible for a market maker to be on "both sides" but the auction volume is comingled so we do not regard it as a self trade

**RT** rose (Rose Toomey) 2017-09-03 08:03 PM

yes, the quoted statement is accurate

**CW** cameron (Cameron Winklevoss) 2017-09-03 08:06 PM

ok could we attempt to prevent the auction self-trade?

**CW** cameron (Cameron Winklevoss) 2017-09-03 08:06 PM

i.e. look through the bulk trade for the participants on both the auction and continuous book?

**RT** rose (Rose Toomey) 2017-09-03 08:14 PM

ben and i discussed this in some detail. first, it complicate the auction algo a *lot*. second, since it's a bulk trade neither of us thought it was per se a self cross. finally, because the auction book is blind, the indicative results don't guarantee to an external participant that his continuous book order as well as his auction book order are taking place except in a situation where the auction and the book are so small it's a degenerate case. so it could happen - to a market maker participating in both books with a decent spread it very well may happen - but i have no numbers to back it up

**RT** rose (Rose Toomey) 2017-09-03 08:16 PM

our conclusion was, why borrow trouble to fix a problem which we don't believe is actually a problem? we prevent explicit self-cross.

rose (Rose Toomey) 2017-09-03 08:20 PM

**RT** i have spent a lot of time trying to figure out what NYSE ARCA does for their auctions and i cannot find a straight answer online

**RT** **rose (Rose Toomey)** 2017-09-03 08:20 PM  
if you have any inside pull, please do ask :slightly\_smiling\_face:

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 08:21 PM  
A friend of mine sent this a while back on March 10th:

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 08:21 PM

Imagine that there are two friends who trade on Gemini, call them Cameron and Tyler. They are both high-volume market-makers. Both of them have a buy/sell ratio of 50/50. Cameron's 30-day volume is >=10k BTC, and Tyler's 30-day volume is >=2000. So, Cameron is entitled to a 0.15% rebate on maker orders, and Tyler is entitled to a fee of 0% of maker orders. Every day, they repeat the following sequence:

- \* Cameron places a nonmarketable limit order in continuous trading to buy 10000 BTC at \$1000. Because this is a nonmarketable limit order, Cameron will receive a rebate of 0.15% on this order when it executes.
- \* Tyler places an auction-only limit order to sell 10000 BTC at \$1000. Because all auction trades receive the maker rate, Tyler will not pay a fee for this order.
- \* For the sake of the example, pretend that there are no other orders (if other people are in the market, Cameron and Tyler will have to place overlapping limit orders, eg buy at \$1010 and sell at \$990, to account for the uncertainty in the auction price movement during the last minute of the auction)

In the next auction, Cameron's and Tyler's orders will cross. Gemini pays Cameron  $10000 \times 1000 \times 0.0015 = \$15000$  in rebates, and collects nothing from Tyler. Cameron has made a lot of money, and as a bonus, both Cameron and Tyler max out their 30-day trading volume without paying any additional fees. Cameron and Tyler's combined net BTC/USD position hasn't changed. But Gemini has lost money on this trade!

This example could of course be extended to a larger group of collaborators that would be more difficult to detect.

**RT** **rose (Rose Toomey)** 2017-09-03 08:23 PM  
ok, in this case the auction would fail because the auction price is > 5 pct away from the midpoint of best bid/best ask

**RT** **rose (Rose Toomey)** 2017-09-03 08:23 PM  
so yes, it would look like obvious market manipulation was taking place, broadcast out over market data and everything

**RT** **rose (Rose Toomey)** 2017-09-03 08:23 PM  
but it wouldn't execute

**RT** **rose (Rose Toomey)** 2017-09-03 08:24 PM  
these two friends would have to be crafty enough to pull this within 5 pct of current midpoint of best bid/best ask

**RT** **rose (Rose Toomey)** 2017-09-03 08:24 PM  
but even that would look really really weird

**RT** **rose (Rose Toomey)** 2017-09-03 08:25 PM  
because the BTCUSD auction is rarely more than +/- 0.5 pct off the midpoint, so we would go investigate

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 08:25 PM  
Ok.

**RT** **rose (Rose Toomey)** 2017-09-03 08:25 PM  
indicatives can swing due to people trying to figure out which way to jump

**RT** **rose (Rose Toomey)** 2017-09-03 08:27 PM  
your friend's example would be much harder to detect if these two friends simply teamed up to recycle ETHBTC back and forth, each collecting a rebate on the make or paying minimal take

**RT** **rose (Rose Toomey)** 2017-09-03 08:28 PM  
then coasted for 30d trailing as their fees gradually went back to 25 bps maker/taker

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 08:28 PM  
Right.

**RT** **rose (Rose Toomey)** 2017-09-03 08:28 PM  
honestly, it would be much easier to just leave auction out of it and tamper with the market itself

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 08:28 PM  
Yup.

**RT** **rose (Rose Toomey)** 2017-09-03 08:29 PM  
our AML detection is extremely crude (sorry michael/dan !) and heavily slanted toward our reporting requirements, not detecting bad market actors

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 08:30 PM  
Yup.

**RT** **rose (Rose Toomey)** 2017-09-03 08:30 PM  
i actually just pinged dan tonight, asking about a TR ownership data set - i was recalling the CBOE ownership dataset request, and wondering - with what confidence could we state that there are not single entities with multiple accounts collaborating just like this on our platform right now?

**RT** **rose (Rose Toomey)** 2017-09-03 08:30 PM  
unless dan has something totally unexpected to say, the answer is, we are not even a little bit sure

**RT** **rose (Rose Toomey)** 2017-09-03 08:30 PM  
which is why i hope we will have a data scientist soon :slightly\_smiling\_face:

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 08:31 PM  
Cool, I'll leave you to review the doc and then bother you for that data request stuff above.

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:00 PM  
Rose what do u think a good list of *Away Market* is?

**RT** **rose (Rose Toomey)** 2017-09-03 09:02 PM  
honestly, i have no idea! are we judging by self-reported BTCUSD volume?

**RT** **rose (Rose Toomey)** 2017-09-03 09:03 PM  
i guess the best thing to do would be to agree on a list with CBOE and a strategy for adding and removing list participants over time due to market conditions or unfortunate events

**RT** **rose (Rose Toomey)** 2017-09-03 09:10 PM  
you could start with what's in winindex now if you think that's a reasonable list to start with, kind of using volume to weight the importance of investigating the discrepancy

**RT** **rose (Rose Toomey)** 2017-09-03 09:18 PM  
the 80 pct two-sided market figure is sticky - some days the BTCUSD auction has been circle and some other market maker swapping funds. based on number of distinct participants this is happening less often but i can't say it would never happen again. due to a number of market makers receiving maker rebates in auction, it's been an incentive for them to show up and place orders at 15:49 even when strictly speaking it represented a small loss, which would be offset by the combination of the maker volume (fee discount) leading to a rebate even in the absence of fee overrides

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:18 PM  
We need some threshold i think, I'm not wedded to a particular number

**RT** **rose (Rose Toomey)** 2017-09-03 09:18 PM  
i had the general impression over the first couple of months auction was ben yelling at shane to engineer a deal via skype or telegram, which shane semi-resented as he would have preferred the block trade volume

**RT** **rose (Rose Toomey)** 2017-09-03 09:21 PM  
i'm just trying to think of how to calculate this number and make it available so we can judge whether 80 pct is reasonable - it seems like it may be, i just don't have the numbers to commit to anything right now. strictest methodology, to record all the periods of time when there were was not a two-sided auction book, for each auction - we haven't done that over time and if we need to, we should add that.

**RT** **rose (Rose Toomey)** 2017-09-03 09:21 PM  
do you mean over the course of the whole auction, from open to close, or just after the first indicative?

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:22 PM  
I mean over the 10minutes

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:22 PM  
Remember this review is only once a month for the Contract Auction

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:23 PM  
This isn't saying we will do it for every auction every time

**RT** **rose (Rose Toomey)** 2017-09-03 09:23 PM  
:relieved: a once a month review is good, i can write sometime to come up with these numbers knowing that requirement

**rose (Rose Toomey)** 2017-09-03 09:24 PM



**RT** also, i wanted to address in general, all this stuff about "auctions" - this document seems to be using "auction" as synonymous with, a BTCUSD auction at 16:00 on a weekday that is not a NYSE holiday

**RT** **rose (Rose Toomey)** 2017-09-03 09:25 PM  
however we also have the SGT auctions that do a fair amount of volume (bert at profluent i think), ETHUSD, weekends, holidays...

**RT** **rose (Rose Toomey)** 2017-09-03 09:27 PM  
also, perhaps i missed it earlier in the document, who is the Market Data Committee at Gemini? because noah and i have some long-standing order book issues to discuss with these people :wink: like orders that live forever (most markets let orders live for 180 days max), no trading sessions, and very off-market orders / market makers who spam the market with non-marketable orders due to bad algos

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:28 PM  
We would LOVE to hear your feedback. I will put a standing meeting on the books.

**RT** **rose (Rose Toomey)** 2017-09-03 09:28 PM  
noah will be so so happy about this!

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:29 PM  
So the process outlines how we review an auction that is used to settle a derivatives contract

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:29 PM  
which in simple terms means the futures contract once a month for now

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:29 PM  
if we add more contracts tied to more auctions, etc. then it will expand

**RT** **rose (Rose Toomey)** 2017-09-03 09:29 PM  
this is relatively familiar to me from my experience in commodities

U02GLRLFN reacted with: pray::skin-tone-2

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:29 PM  
but for now will be 1 / month review according to procedures of this document

**RT** **rose (Rose Toomey)** 2017-09-03 09:30 PM  
although i was never a part of contract settlement, i knew what it was and some of the details around how it worked - i worked at an ECE and there was all kinds of stuff we had to do

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:43 PM  
Well then I very glad you are reviewing this doc.

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:44 PM  
Cause CFTC wants to know we have good procedures in place to make sure contract settlement has integrity.

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:44 PM  
Would you compare our Auction Price to midpoint of Away Markets, or spot prices?

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:45 PM  
I'm thinking midpoint cause nothing says those markets will have a trade exactly at 4pm

**RT** **rose (Rose Toomey)** 2017-09-03 09:46 PM  
this is a difficult question. WTI options used a midpoint of best bid/ask at 14:45 on the CME (this time was supposed to be "the best" and all the greeks were calculated based on this price)

**RT** **rose (Rose Toomey)** 2017-09-03 09:47 PM  
each futures contract had a different specific convention

**RT** **rose (Rose Toomey)** 2017-09-03 09:47 PM  
spot prices are subject to *extreme volatility*

**RT** **rose (Rose Toomey)** 2017-09-03 09:48 PM  
in our market, i believe there is no difference between the midpoint and a spot price but i may be wrong - noah is more familiar with FX conventions than i am

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:48 PM  
Do you know if Noah is around tomorrow?

**RT** **rose (Rose Toomey)** 2017-09-03 09:48 PM  
i just pinged him, he's around now

**CW** **cameron (Cameron Winklevoss)** 2017-09-03 09:49 PM  
Awesome, ill tag him

**RT** **rose (Rose Toomey)** 2017-09-03 09:49 PM  
he wasn't showing up online but he was extremely excited to hear he might have an opportunity to bring gemini more in line with external market conventions and less in line with weirdo what other crypto exchanges do conventions

CW

**cameron (Cameron Winklevoss)** 2017-09-03 09:50 PM  
Lol.

RT

**rose (Rose Toomey)** 2017-09-03 09:50 PM  
i can say that what we're trying to do with auction is solve the "spot price" problem in BTCUSD by providing a better pricing mechanism

CW

**cameron (Cameron Winklevoss)** 2017-09-03 09:50 PM  
Yup

RT

**rose (Rose Toomey)** 2017-09-03 09:51 PM  
more stable, less subject to tampering, a new convention and one more in line with what is done for equities

RT

**rose (Rose Toomey)** 2017-09-03 09:52 PM  
so i don't know if a spot price comparison against other exchanges is a good comparison, we might want to do some type of comparison of their pricing over time or something, to say that our price captures most succinctly a general trend over this time period that a number of comparable "away exchanges" are converging toward

CW

**cameron (Cameron Winklevoss)** 2017-09-03 09:53 PM  
Ok, so more like the VWAP of the day?

RT

**rose (Rose Toomey)** 2017-09-03 09:53 PM  
yes, although probably for a shorter time period that that since in a volatile market the VWAP of a day hasn't got a whole lot of meaning

CW

**cameron (Cameron Winklevoss)** 2017-09-03 09:53 PM  
VWAP over 10min?

U02GKPU6P reacted with: +1

RT

**rose (Rose Toomey)** 2017-09-03 09:53 PM  
or we could take the tactic of choosing a spot price at a certain time on a certain large stable exchange, that is what is done for some types of options

RT

**rose (Rose Toomey)** 2017-09-03 09:55 PM  
i'd be willing to go with a VWAP over 10 minutes, let's see what noah thinks. he has a lot of experience in FX and i have none, so his perspective is valuable to me because - like commodities - FX is very different to the rest of the market

RT

**rose (Rose Toomey)** 2017-09-03 10:14 PM  
ok, i believe i have responded to everything in the document

RT

**rose (Rose Toomey)** 2017-09-03 10:14 PM  
so i will go get that data for you

CW

**cameron (Cameron Winklevoss)** 2017-09-03 10:16 PM  
Excellent, thank you.

RT

**rose (Rose Toomey)** 2017-09-03 10:17 PM  
Top 3 makers on ETHUSD

[https://iceland.slack.com/files/U02GKPU6P/F6XK9T25R/top\\_3\\_makers\\_on\\_ethusd.csv](https://iceland.slack.com/files/U02GKPU6P/F6XK9T25R/top_3_makers_on_ethusd.csv)

RT

**rose (Rose Toomey)** 2017-09-03 10:18 PM  
Top 3 makers on ETHBTC

[https://iceland.slack.com/files/U02GKPU6P/F6XRK0HGD/top\\_3\\_makers\\_on\\_ethbtc.csv](https://iceland.slack.com/files/U02GKPU6P/F6XRK0HGD/top_3_makers_on_ethbtc.csv)

RT

**rose (Rose Toomey)** 2017-09-03 10:19 PM  
Top 3 takers ETHUSD

[https://iceland.slack.com/files/U02GKPU6P/F6YQ77NBH/top\\_3\\_takers\\_ethusd.csv](https://iceland.slack.com/files/U02GKPU6P/F6YQ77NBH/top_3_takers_ethusd.csv)

RT

**rose (Rose Toomey)** 2017-09-03 10:19 PM  
Top 3 takers ETHBTC

[https://iceland.slack.com/files/U02GKPU6P/F6XMHM6E6/top\\_3\\_takers\\_ethbtc.csv](https://iceland.slack.com/files/U02GKPU6P/F6XMHM6E6/top_3_takers_ethbtc.csv)

RT

**rose (Rose Toomey)** 2017-09-03 10:19 PM  
well this is all very incestuous

RT

**rose (Rose Toomey)** 2017-09-03 10:20 PM

we have some lannister-level action on these books :laughing:

CW

**cameron (Cameron Winklevoss)** 2017-09-03 10:21 PM

Thank you.

RT

**rose (Rose Toomey)** 2017-09-03 10:22 PM

if you want more information i can run through those books and isolate the distinct crosses and fees vs rebates

RT

**rose (Rose Toomey)** 2017-09-03 10:23 PM

it's a small market, let's not pretend a bunch of these guys don't know each other, a lot of it was hand-developed

RT

**rose (Rose Toomey)** 2017-09-03 10:23 PMthey can't *exactly* chose who they cross with, it's not as thin as it used to be

RT

**rose (Rose Toomey)** 2017-09-03 10:24 PM

but based on the level of negative fees,

1. there could be collusion, or
2. our fee schedules might be encouraging some unfortunate patterns

CW

**cameron (Cameron Winklevoss)** 2017-09-03 10:27 PM

Agreed. How long would it take you to run through the books and isolate the distinct crosses and fees vs. rebates?

RT

**rose (Rose Toomey)** 2017-09-03 10:28 PM

as an ad hoc data project? probably two hours to write the code and a couple of hours to run it over the specified time period

RT

**rose (Rose Toomey)** 2017-09-03 10:29 PM

i would group at three levels, within each trading pair, and then across pairs of trading pairs, and then finally across all trading pairs

CW

**cameron (Cameron Winklevoss)** 2017-09-03 10:29 PM

Yea as an ad hoc data project.

RT

**rose (Rose Toomey)** 2017-09-03 10:30 PM

just see what comes out over time, say may 1 - august 31

CW

**cameron (Cameron Winklevoss)** 2017-09-03 10:30 PM

yup that time period.

RT

**rose (Rose Toomey)** 2017-09-03 10:31 PM

noah and i have been curious for a while, we stopped watching because... well, the exchange blew up and we had other problems

CW

**cameron (Cameron Winklevoss)** 2017-09-03 10:34 PM

Ok, if 2 hrs for ad hoc analysis let's do that. Any chance you could get me it before Tuesday AM?

RT

**rose (Rose Toomey)** 2017-09-03 10:38 PM

sure, let me see what i can do tomorrow night

CW

**cameron (Cameron Winklevoss)** 2017-09-03 10:46 PM

perfect.

CW

**cameron (Cameron Winklevoss)** 2017-09-03 11:36 PM

Rose can you also pull top 3 takers BTC/USD and 3 makers BTC/USD?

RT

**rose (Rose Toomey)** 2017-09-03 11:46 PM

Yes, let me grab that now

RT

**rose (Rose Toomey)** 2017-09-03 11:47 PM

Top 3 taker BTCUSD

[https://iceland.slack.com/files/U02GKPU6P/F6XMYDRCJ/top\\_3\\_taker\\_btcsd.csv](https://iceland.slack.com/files/U02GKPU6P/F6XMYDRCJ/top_3_taker_btcsd.csv)

RT

**rose (Rose Toomey)** 2017-09-03 11:47 PM

Top 3 maker BTCUSD

[https://iceland.slack.com/files/U02GKPU6P/F6YQN6G07/top\\_3\\_maker\\_btcsd.csv](https://iceland.slack.com/files/U02GKPU6P/F6YQN6G07/top_3_maker_btcsd.csv)